USER MANUAL

ONLINE UPS

1-3K/220Vac LCD

Uninterruptible Power Systems

Please comply with all warnings and operating instructions in this manual and on the unit strictly. Save this manual properly. Do not operate this unit before reading through all safety information and operating instructions carefully.

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1. Safety and EMC instructions

Please read carefully the following user manual and the safety instructions before installing the unit or using the unit!

1.1 Installation

★ Condensation may occur if the UPS is moved directly from a cold to a warm environment. The UPS must be absolutely dry before being installed. Please allow an acclimatization time of at least two hours.

★ Do not install the UPS near water or in damp environment.

★ Do not install the UPS where it would be exposed to direct sunlight or near heat.

★ Do not block ventilation openings in the UPS's housing.

★ Do not connect appliances or items of equipment which would overload the UPS (e.g. laser printers, etc) to the UPS output.

★ Place cables in such a way that no one can step on or trip over them.

★ Socket-outlets and socket of batteries are earthed by the input power cord, please insert the power cord into mains socket before using of UPS.

★ Connect the UPS only to an earthed shockproof socket outlet.

★ The building wiring socket outlet (shockproof socket outlet) must be easily accessible to close to the UPS.

★ This is operator installable .

★ Assure to connect with the earth reliably.

★ With the installation of the equipment,the sum of the leakage current of the UPS and the connected load does not exceed 3.5mA.

1.2 Operation

- ★ Do not disconnect the mains cable on the UPS or the building wiring socket (grounded shockproof socket) during operation as this would remove the ground to the UPS and of all connected loads.
- ★ The UPS features its own, internal current source (batteries). You may be electric shock when you touch the UPS output sockets or output terminal block even if the UPS is not connected to the building wiring socket.
- ★ In order to fully disconnect the UPS, first press the Standby button, then disconnect the mains lead.
- ★ Ensure that no liquid or other foreign objects can enter the UPS.
- ★ The UPS can be operated by any individuals with no previous experience.

1.3 Maintenance, servicing and faults

- ★ The UPS operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.
- ★ Caution - risk of electric shock. Even after the unit is disconnected from the mains power supply (building wiring socket), components inside the UPS are still connected to the battery which are potentially dangerous.
- ★ Before carrying out any kind of service and/or maintenance, disconnect the batteries. Verify that no current is present and no hazardous voltage exists in the capacitor or BUS capacitor terminals.
- ★ Batteries must be replaced only by qualified personnel.
- ★ Caution - risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Verify that no voltage is

present before servicing!

★ Batteries have a high short-circuit current and pose a risk of shock. Take all precautionary measures specified below and any other measures necessary when working with batteries:

- remove all jewellery, wristwatches, rings and other metal objects
- use only tools with insulated grips and handles.

★ When changing batteries, replace with the same quantity and the same type of batteries.

★ Do not attempt to dispose of batteries by burning them. It could cause explosion.

★ Do not open or destroy batteries. effluent electrolyte can cause injury to the skin and eyes. It may be toxic.

★ Please replace the fuse only by a fuse of the same type and of the same amperage in order to avoid fire hazards.

★ Do not dismantle the UPS, except the qualified maintenance personnel.

1.4 Transport

★ Please transport the UPS only in the original packaging (to protect against shock and impact).

1.5 Storage

★ The UPS must be stockpiled in the room where it is ventilated and dry.

1.6 Standards

*** Safety**	
IEC/EN 62040-1-1	
*** EMI**	
Conducted Emission.....:IEC/EN 62040-2	Category C1
Radiated Emission.....:IEC/EN 62040-2	Category C1
Harmonic Current.....:IEC/EN 61000-3-2	
Voltage Fluctuation and Flicker.....:IEC/EN 61000-3-3	
***EMS**	
ESD.....:IEC/EN 61000-4-2	Level 4
RS.....:IEC/EN 61000-4-3	Level 3
EFT.....:IEC/EN 61000-4-4	Level 4
SURGE.....:IEC/EN 61000-4-5	Level 4
Low Frequency Signals.....:IEC/EN 61000-2-2	

2. Description of commonly used symbols

Some or all of the following symbols may be used in this manual. It is advisable to familiarize yourself with them and understand their meaning:

Symbol and Explanation			
Symbol	**Explanation**	**Symbol**	**Explanation**
	Alert you to pay special attention		Protective ground
	Caution of high voltage		Alarm silence
	Turn on the UPS		Overload indication
	Turn off the UPS		Battery
	Idle or shut down the UPS		Recycle
	Alternating current source (AC)		Do not dispose with ordinary trash
	Direct current source (DC)		

3. Introduction

This On-Line-Series is an uninterruptible power supply incorporating double-converter technology. It provides perfect protection specifically for Novell, Windows NT and UNIX servers.

The double-converter principle eliminates all mains power disturbances. A rectifier converts the alternating current from the socket outlet to direct current. This direct current charges the batteries and powers the inverter. On the basis of this DC voltage, the inverter generates a sinusoidal AC voltage, which permanently supplies the loads.

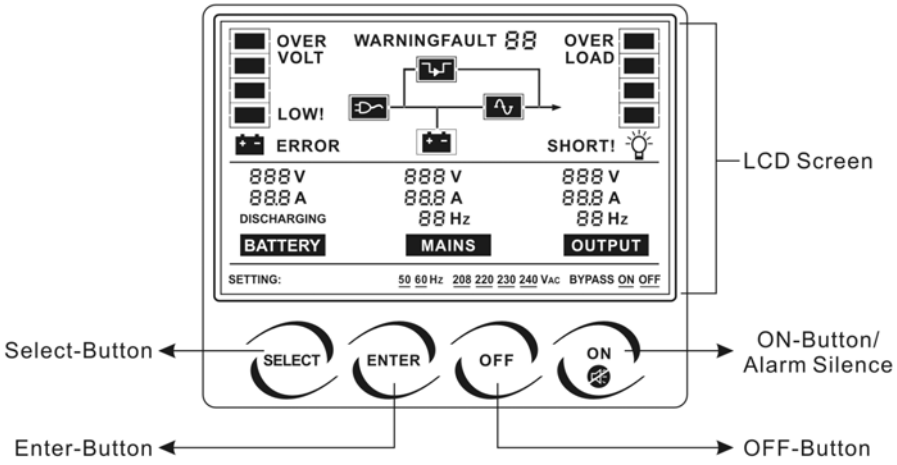
Computers and periphery are thus powered entirely by the mains voltage. In the event of power failure, the maintenance-free batteries power the inverter.

This manual covers the UPS listed as follows. Please confirm whether it is the model you intend to purchase by performing a visual inspection of the Model No. on the rear panel of the UPS.

Model No.	Type	Model No.	Type
1K	Standard	1KS	Extended backup time
2K		2KS	
3K		3KS	

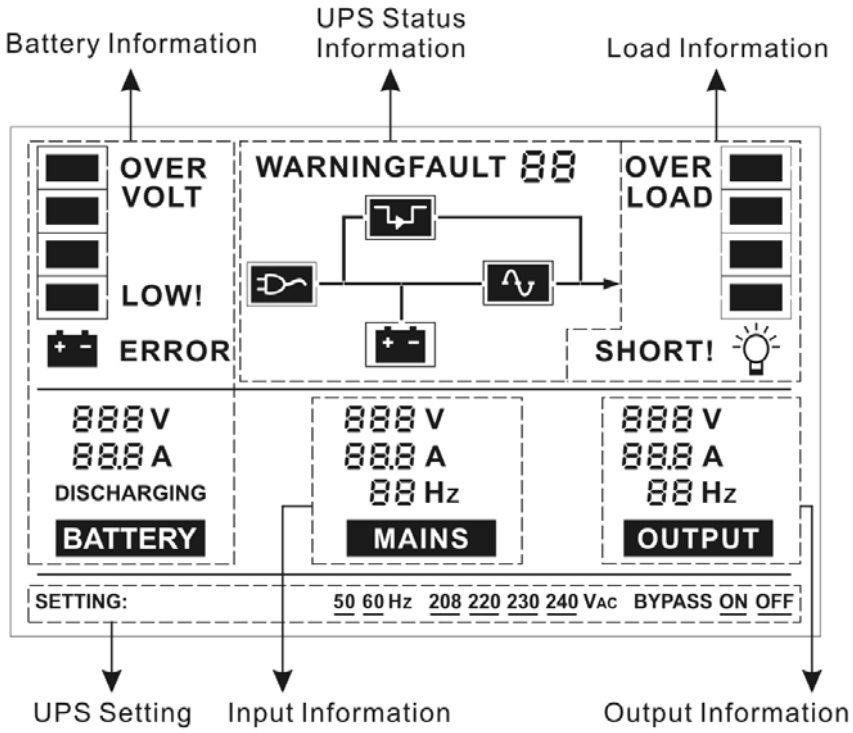
“S” Model: Extended backup time

4. Panel description



The Display Panel

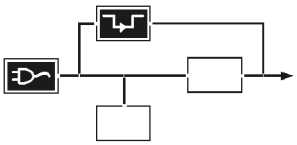
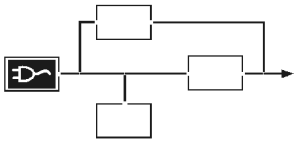
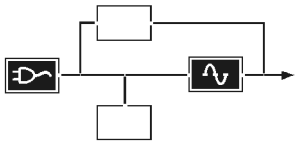
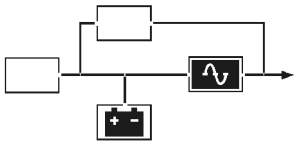
Switch	Function
ON-Button	Turn on UPS system: By pressing the “ON” button the UPS system is turned on. Deactivate acoustic alarm: By pressing this Button an acoustic alarm can be deactivated.
OFF-Button	When mains power is normal, the UPS system switches to No output or Bypass mode by pressing “OFF” button, and the inverter is off. At this moment, if Bypass is enabled, then the output sockets are supplied with voltage via the bypass if the mains power is available.
Select-Button	If the UPS system is No output or Bypass mode, the output voltage and frequency and Bypass disable/enable could be selected by pressing Select-Button, and confirmed by pressing Enter-Button.
Enter-Button	If the UPS system is No output or Bypass mode, the output voltage and frequency and Bypass disable/enable could be selected by pressing Select-Button, and confirmed by pressing Enter-Button.



The LCD Display

Display	Function
Input Information	
888 V	Indicates the input Line voltage value, which could be displayed from 0 to 999Vac
88 Hz	Indicates the frequency value of input Line voltage, which could be displayed from 0 to 99Hz
88.8 A	Indicates the input Line current value, which could be displayed from 0 to 99.9A
Output Information	
888 V	Indicates the UPS output voltage value, which could be displayed from 0 to 999Vac

88 Hz	Indicates the frequency value of the UPS output voltage, which could be displayed from 0 to 99Hz
88.8 A	Indicates the UPS output current value, which could be displayed from 0 to 99.9A
Load Information	
SHORT!	Indicates the load or the UPS output is short and the UPS would shut down
OVER LOAD	Indicates the load is over the SPEC range
	Indicates the load percent, and the lowest grid represent 30% load, the two low grids represent 60% load, the three low grids represent 90% load, all the grids represent 100% load.
Battery Information	
888 V	Indicates the battery voltage value, which could be displayed from 0 to 999Vdc
88.8 A	Indicates the battery current value, which could be displayed from 0 to 99.9A
	Indicates the battery capacitance percent, and every grid represent 25% capacitance. All the grids represent 100% capacitance.
DISCHARGING	Indicates the UPS is working in the battery mode, and the battery is discharged for supplying the load
CHARGING	Indicates the battery is being charged
OVER VOLT	Indicates the battery is over charged, and the UPS would be switched to Battery mode
LOW!	Indicates the battery is weak, and the UPS would shut down soon
UPS status Information	
88	Indicates some the warning or fault occur in the UPS, fault code or warning code could be displayed, and the codes are illuminated in detail in the following chapter

	Indicates the UPS is working in bypass mode, the load is directly supplied by the input power through bypass
	Indicates the UPS is working in no output mode
	Indicates the UPS is working in line mode
	Indicates the UPS is working in battery mode or battery test mode
FAULT	Indicates the UPS is working in fault mode
WARNING	Indicates some warnings occur which need be attention
UPS setting Information	
208 220 230 240 VAC	The four value of the output voltage could be selected when the UPS is in No output or Bypass mode, and only one of them could be active in the same time. Derating 10% when the output voltage is adjusted to 208VAC
50 60 Hz	The two frequency value of the output voltage could be selected when the UPS is in No output or Bypass mode, and only one of them could be active in the same time
BYPASS ON OFF	Bypass disable or enable could be selected when the UPS is in No output or Bypass mode, and only one of them could be active in the same time

5. Connection and operation

The system may be installed and wired only by qualified electricians in accordance with applicable safety regulations!

When installing the electrical wiring, please note the nominal amperage of your incoming feeder.

5.1 Inspection:

Inspect the packaging carton and its contents for damage. Please inform the transport agency immediately should you find signs of damage.

Please keep the packaging in a safe place for future use.

Note: Please ensure that the incoming feeder is isolated and secured to prevent it from being switched back on again.

5.2 Connection:

(1) UPS Input Connection

If the UPS is connected via the power cord, please use a proper socket with protection against electric current, and pay attention to the capacity of the socket: over 10A for 1K(S) & 2K, over 16A for 2KS& 3K(S).

(2) UPS Output Connection

The output of 1K(S), 2K are socket-types only. Simply plug the load power cord to the output sockets to complete connection.

Model No.	**Output Socket (pcs)**	**Terminal Block**
1K/1KS	4	Nil
2K	6	Nil
2KS	4	Available
3K/3KS	4	Available

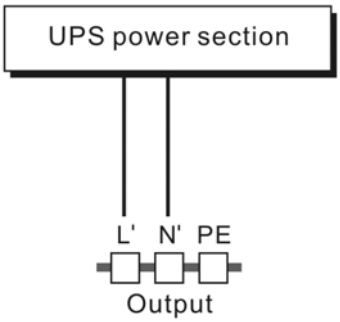
Besides output sockets,2KS and 3K/3KS has the terminal block available for output as well. The wiring configuration is shown as the following procedure:

a) Remove the small cover of the terminal block

b) Use AWG14 or 2.1mm^2 wires for wiring configuration

c) Upon completion of the wiring configuration, please check whether the wires are securely affixed.

d) Put the small cover back to the rear panel.



Connection diagram of 2KS and 3K(S)

(3) Computer Connection:

Connect your computer to the outlet sockets of the UPS system following the above diagram.

Caution!
Do not connect equipment which would overload the UPS system (e.g. laser printers)

5.3 Battery Charge:

Fully charge the batteries of the UPS system by leaving the UPS system connected to the mains for 1-2 hours. You may use the UPS system directly without charging it but the stored energy time may be shorter than the nominal value specified.

5.4 Turn On the UPS:

(1) With utility power connecting:

Press “I” button continuously for more than 1 second to turn on the UPS. Then the UPS will get into self-test status first. After having

finishing the self-test, the UPS will get into the inverter mode, at this time, the LCD screen will light up and indicate the state of the UPS.

(2) Without utility power connecting:

Even though utility power is not connected to the UPS, the UPS still can be turned on by just simply pressing “I” button continuously for more than 1 second. Then the UPS will get into self-test status first. After having finishing the self-test, the UPS will get into the inverter mode, at this time, the LCD screen will light up and indicate the state of the UPS.

Note: The default setting for bypass mode is no output after UPS is connecting utility power and breaker is turned on. This can be configured by monitoring the LCD panel or firmware.

5.5 Test Function:

Test the function of the UPS system by either pressing the “On” button or disconnecting the input of the UPS system from the power supply.

5.6 Turn Off the UPS:

(1) In Inverter Mode:

Press “OFF” button continuously for more than 1 second to turn off the UPS. Then the UPS will get into self-test status first. After having finished the self-test, the UPS will get into no output or bypass mode. At this time, the UPS might has output if bypass is enabled. Disconnect the utility power to turn off the output.

(2) In Battery Mode:

Press “OFF” button continuously for more than 1 second to turn off the UPS. Then the UPS will get into self-test status first. After having finished the self-test, the UPS will be turned off completely.

5.7 Audible Alarm Mute Function:

If the alarm is too annoying in battery mode, you may press “ON” button continuously for more than 1 second to clear it. Moreover, the alarm will be enabled when the battery is low to remind you to shutdown the load soon.

5.8 Operation Procedure of External Battery for Long Backup time Model (“S” Model)

The units with CE markings—

(1) Use the battery pack with voltage: 36VDC for 1KS (3 pcs of 12V batteries), 96VDC for 2KS/ 3KS (8 pcs of 12V batteries). Connection of batteries more than or less than required will cause abnormality.

(2) One end of the external battery cord is a plug for connecting the UPS and the other end has a plug for connecting the user battery cabinet.

(3) Do not connect the UPS to any load yet. Then, connect the power cord of the UPS to supply utility power to the UPS to make the UPS operate in utility power mode.

(4) Connect the plug of the external battery cord to the external battery socket on the rear panel of the UPS to complete the connection procedure and the UPS will start to charge the battery pack.

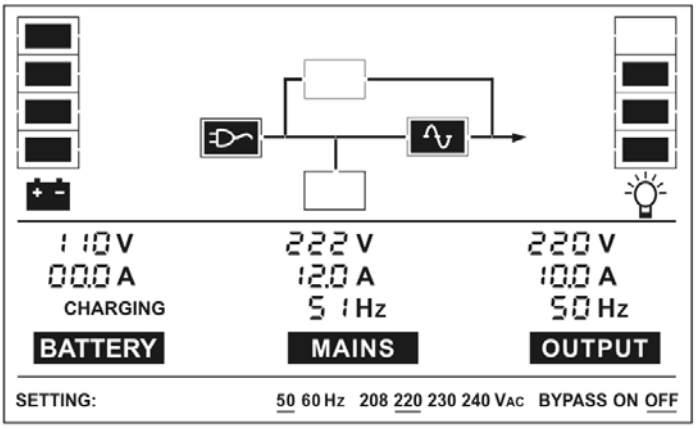
(5) The red wire is connected to the "+" terminal of the battery. The black wire is connected to the "-" terminal of the battery. (Note: the green/yellow wire is grounded for protection purpose.)

The Caution!
The output sockets of the UPS system may still be electrically live even if the power supply system has been disconnected or the Bypass switch is on “OFF” position.

6. Operating mode for all models

6.1 Line mode

The LCD display in Line mode is shown in the following diagram. The information about the utility power, the battery, the UPS output and the load could be displayed.



■ **The Line mode**

If output overloaded, the load percent is shown and alarm will keep twice every second. You should get rid of some unnecessary loads one by one to decrease the loads connected to the UPS less than 90% of its nominal power capacity.

Note: Please follow the following steps to connect the generator：

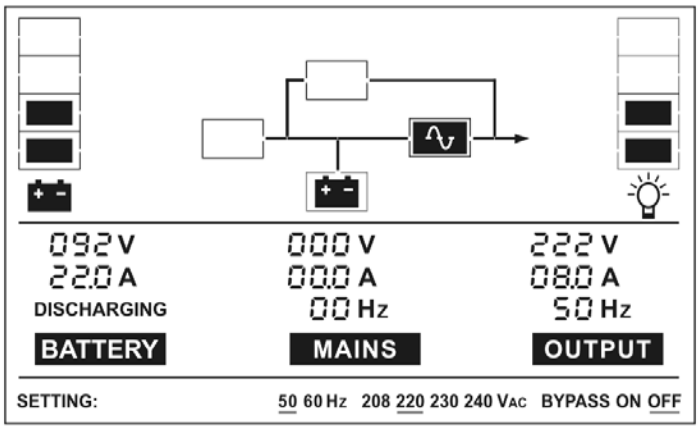
- Activate the generator and wait until the operation is stable before supplying power of the generator to the UPS (be sure that the UPS is in idle mode). Then turn on the UPS according to the start-up procedure. After the UPS is turned on, then the loads can be connected to the UPS one by one.
- The power capacity of the AC generator should be at least twice of the UPS capacity.

6.2 Battery mode

The LCD display in battery mode is shown in the following diagram. The information about the utility power, the battery, the UPS output and the load could be displayed.

(1) When the UPS is running in battery mode, the buzzer beeps once every 4 seconds. If the “ON” button on the front panel is pressed for more than 1 second again, the buzzer will stop beeping (in silence mode). Press the “ON” button once again for more than 1 second to resume the alarm function.

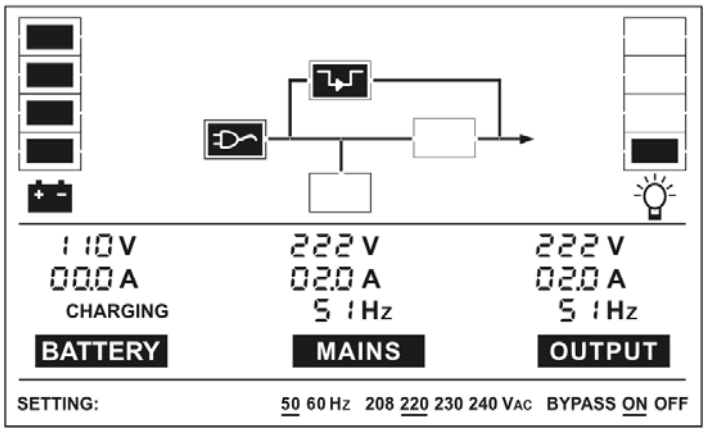
(2) The display is the same in battery test mode.



■ **The Battery mode**

6.3 Bypass mode

The LCD display in bypass mode is shown in the following diagram. The information about the utility power, the battery, the UPS output and the load could be displayed. The UPS will beep once every 2 minutes in bypass mode.

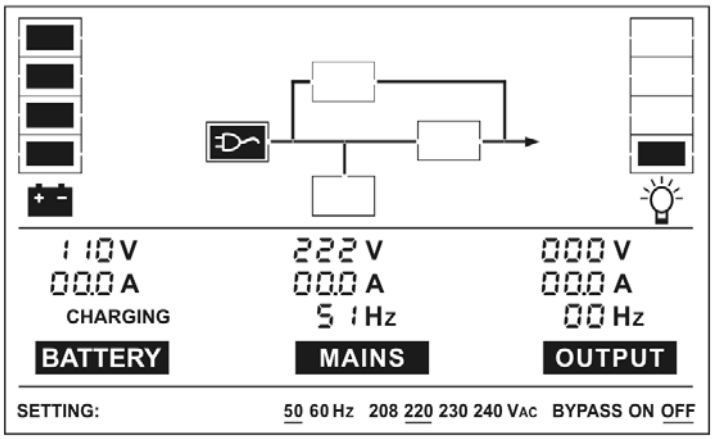


■ **The Bypass mode**

The UPS does not have the backup function when it is in bypass mode. The power used by the load is supplied from the utility power via internal filter.

6.4 NO output mode

The LCD display in no output mode is shown in the following diagram. The information about the utility power, the battery, the UPS output and the load could be displayed.



■ **The NO output mode**

6.5 Abnormal mode

In abnormal mode such as Bus fault etc., the corresponding fault code would be shown to indicate the operating mode of the UPS. And some warning words could also be shown, for example “short!” would be shown when the load or the UPS output is short and the UPS is in inverter fault mode.

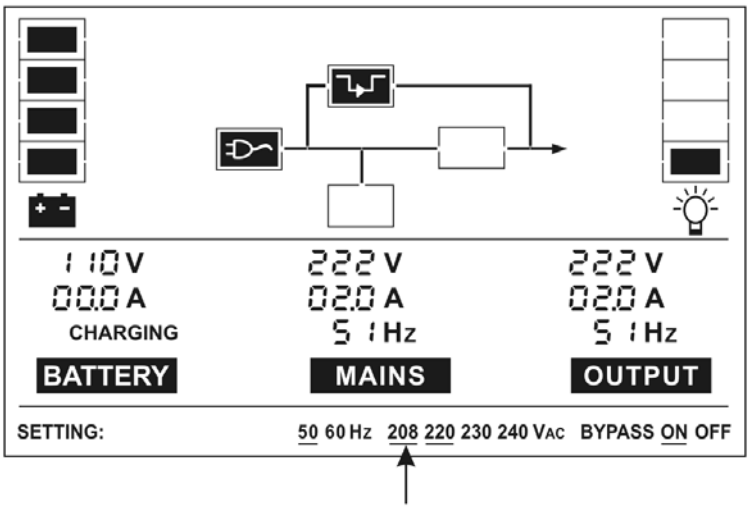
7. Setting by LCD module

The output voltage and frequency and bypass state could be set directly through LCD module. The output voltage could be set to 208V, 220V, 230V and 240V. The output frequency could be set to 50Hz and 60Hz. The bypass state could be set to enable and disable. But all the settings could only be done when the UPS is in bypass or no output mode.

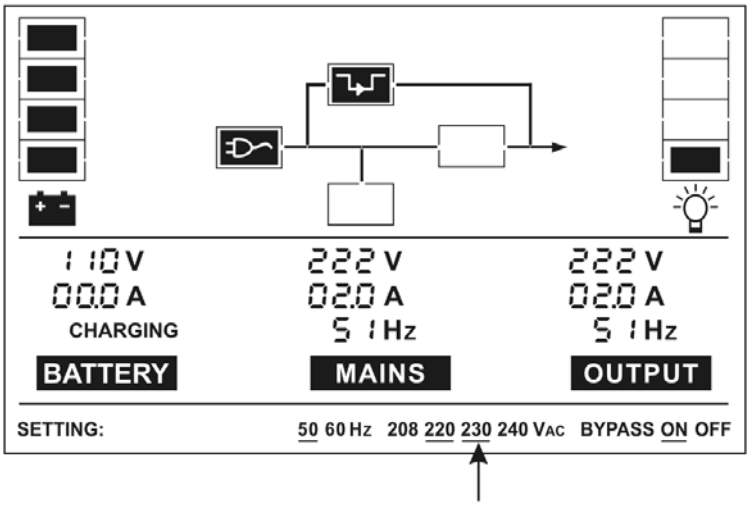
In bypass or no output mode, pressing the “Select” button on the LCD panel for more than one second, a flickering black line would be shown under “208V” on the screen. And if pressing the “Select” button continuously again, the flickering black line would move to “220V”, next to “230V”, “240V”, “50Hz”, “60Hz”, “Bypass Disable”, “Bypass Enable” in turn. And if pressing the “Enter” button for more than one second at this time, the flickering black line would turn to flickerless and the output voltage or frequency or bypass state setting would be modified to the selected value. And if no any pressing on the “Select” or “Enter” button lasting for more than ten seconds, the flickering black line would disappear.

The only one voltage value could be selected in “208V”, “220V”, “230V”, “240V” at any time. The only one frequency value could be selected in “50Hz”, “60Hz” at any time. And the output voltage and frequency would be changed to the corresponding value after the right values are selected on the LCD panel and the UPS is turn on by pressing the “ON” Button. The UPS would turn to bypass mode in several seconds after “Bypass Enable” is selected, and turn to no output mode in several seconds after “Bypass Disable” is selected.

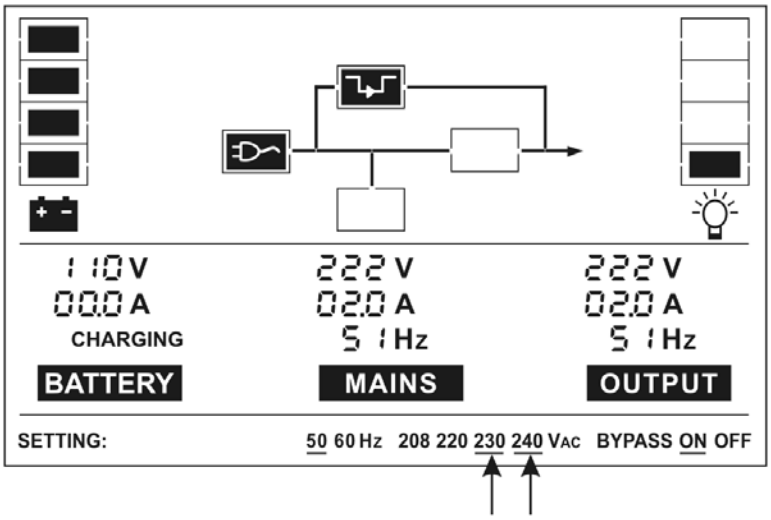
■ **Here is a example for changing the output voltage from 220Vac to 230Vac through the LCD panel.**



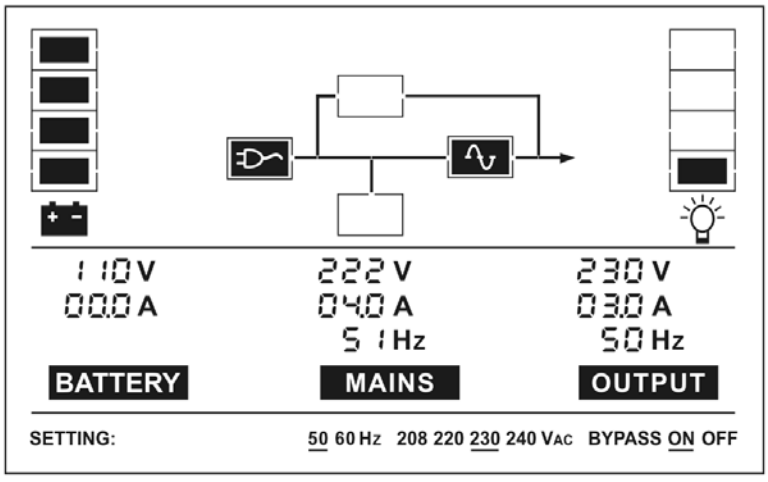
Setp 1: One flickering black line would appear under “208Vac” after pressing the “Select” button.



Setp 2: The flickering line would move to “230Vac” after pressing the “Select” button two times again.



Setp 3: The line under “230Vac” would turn to flickerless after pressing the “Enter” button, and the flickering line would move to the next “240Vac”.



Setp 4: The output voltage would be 230Vac after the UPS is turned on.

8. Trouble shooting

If the UPS is working abnormally, the warning or fault codes would be shown to indicate the status of UPS. Even several warnings could appear in the same time, and the warning codes would be shown circularly. Once one fault is come forth, then all previous warnings would not be shown again but only the fault code is presented.

Warning and Fault	Code	Warning and Fault	Code
Bus fault	05	Site fail warning	09
Inverter fault	06	Fan fail warning	10
Overload fault	07	Bat over warning	11
Over temperature fault	08	Bat weak warning	12
		Charger fail warning	13

If the UPS system does not operate correctly, please attempt to solve the problem using the table below.

Problem	Possible cause	Remedy
No indication, no warning tone even though system is connected to mains power supply	No input voltage	Check building wiring socket outlet and input cable.
The status indicates the UPS is in no output or bypass mode, even though the power supply is available	Inverter not switched on	Press “ON” button and turn on the UPS

The status indicates the UPS is in battery mode, and audible alarm sounding every 1 beep in every 4 seconds	Mains power supply has failed or input power and/or frequency are out of tolerance	Switching to battery mode automatically. When audible alarm sounding every second, battery is almost empty. Check input power source and inform dealer if necessary
Warning code is shown as 09	Phase and neutral conductor at input of UPS system are reversed	Rotate mains power socket by 180° or connect UPS system.
Warning code is shown as 13, warning tone once a second	Charger or Batteries damaged	Notify dealer!!
Warning code is shown as 10	Fan is locked or not working	Check fans and notify dealer!!
Fault code is shown as 07, warning tone once a second	Overload	Remove loads of UPS output and restart.
Fault code is shown as 05 or 06 or 08, permanent warning tone	UPS fault	Notify dealer!!
Emergency supply period shorter than nominal value	Batteries not fully charged / batteries defect	Charge the batteries for at least 1 ~ 2 hours and then check capacity. If the problem still persists, consult your dealer.

Please have the following information at hand before calling the After-Sales Service Department:

1. Model number, serial number
2. Date on which the problem occurred
3. Detailed description of the problem

9. Maintenance

9.1 Operation

The UPS system contains no user-serviceable parts. If the battery service life (3~5 years at 25°C ambient temperature) has been exceeded, the batteries must be replaced. In this case please contact your dealer.

9.2 Storage

If the batteries are stored in temperate climatic zones, they should be charged every three months for 1~2 hours. You should shorten the charging intervals to two months at locations subject to high temperatures.

10. Technical data

10.1 Electrical specifications

INPUT				
Model No.	1K(S)	2K	2KS	3K(S)
Phase	Single			
Frequency	(46~54)/(56~64) Hz			
Current(A)	7A	9A	12A	16A

OUTPUT			
Model No.	1K(S)	2K(S)	3K(S)
Power rating	1kVA/0.7kW	2kVA/1.4kW	3kVA/2.1kW
Voltage	208/220/230/240×（1±2%）VAC		
Frequency	50/60×（1±0.2）Hz (Battery mode)		
Wave form	sinusoidal		

Derating 10% when the output voltage is adjusted to 208VAC

BATTERIES			
Model No.	1K	2K	3K
Number and type	3×12V 7.2Ah	8×12V 7.2Ah	8×12V 7.2Ah

10.2 Operating Environment

Ambient Temperature	0 °C to 40 °C
Operating humidity	< 95%
Altitude	< 1000m
Storage temperature	0 °C ~ 40 °C

10.3 Typical stored energy time (Typical values at 25°C in minutes:)

Model No.	100 % Load	50 % Load
1K	5	14
2K	9	21
3K	5	15

10.4 Dimensions and weights

Model No.	Dimensions W×D×H (mm)	Net Weight (kg)
1K	145×400×220	14
1KS	145×400×220	7
2K	192×460×340	34.5
2KS	192×460×340	15
3K	192×460×340	35.5
3KS	192×460×340	16

11. Communication port

11.1 RS232 Interface

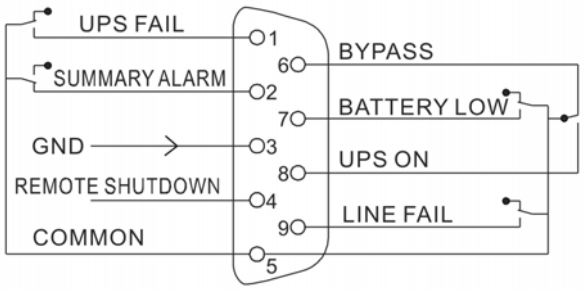
The following is the pin assignment and description of DB-9 connector.

Pin #	Description	I/O
2	TXD	Output
3	RXD	Input
5	GND	Input

11.2 AS400 Interface (Option)

Except for the communication protocol as mentioned above, this series UPS has AS400 card (an optional accessory) for AS400 communication protocol . Please contact your local distributor for details. The following is the pin assignment and description of DB-9 connector in AS400 card.

Pin #	Description	I/O	Pin #	Description	I/O
1	UPS Fail	Output	6	Bypass	Output
2	Summary Alarm	Output	7	Battery Low	Output
3	GND	Input	8	UPS ON	Output
4	Remote Shutdown	Input	9	Line Loss	Output
5	Common	Input			

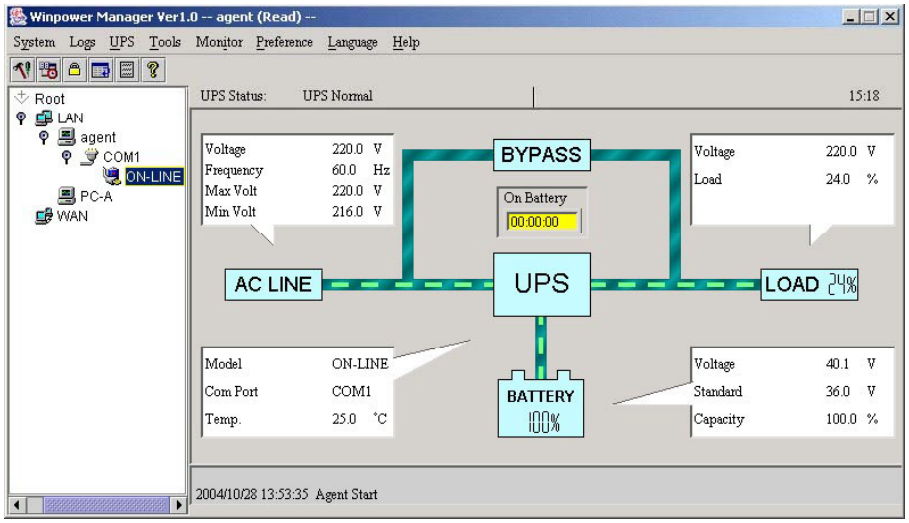


DB-9 Interface of AS400 communication protocol

12. Software for all models

Free Software Download – WinPower

WinPower is a brand new UPS monitoring software, which provides user-friendly interface to monitor and control your UPS. This unique software provides safely auto shutdown for multi-computer systems while power failure. With this software, users can monitor and control any UPS on the same LAN no matter how far from the UPSs.

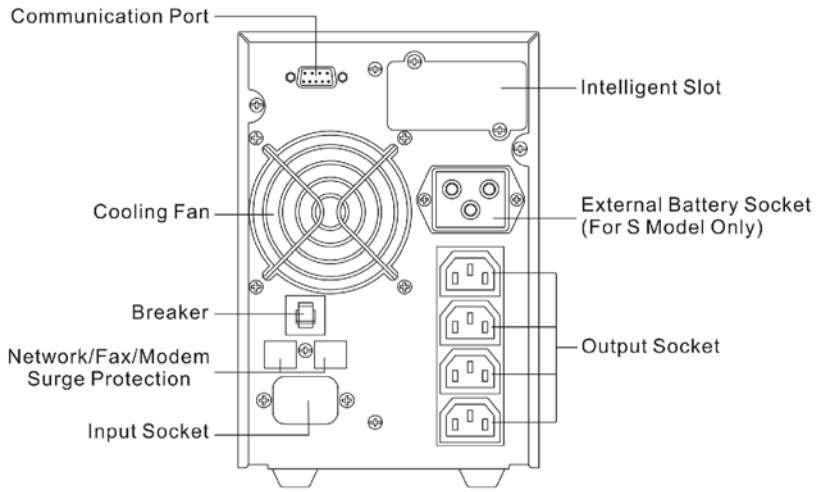


Installation procedure:

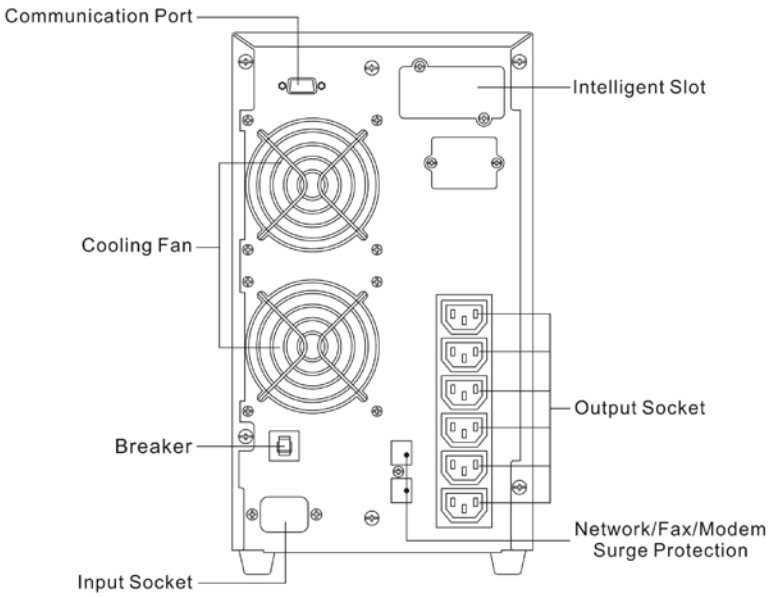
1. Go to the website:
   http://www.ups-software-download.com/winpower.htm
2. Choose the operation system you need and follow the instruction described on the website to download the software.
3. When downloading all required files from the internet, enter the serial No: **511C1-01220-0100-478DF2A** to install the software.

When your computer restarts, the WinPower software will appear as a green plug icon located in the system tray, near the clock.

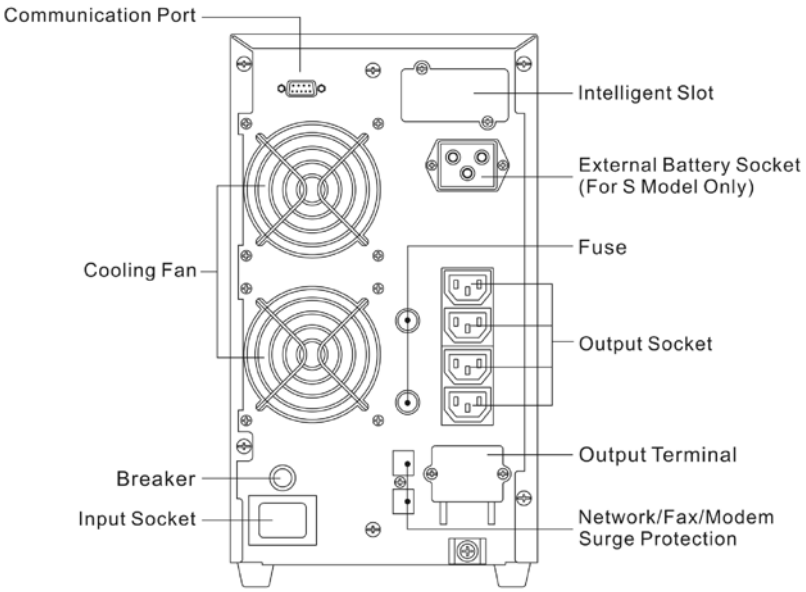
Appendix: Rear panel



Back View of 1K & 1KS



Back View of 2K



Back View of 2KS & 3K(S)

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